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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,172	03/27/2001	Eliot M. Case	1814 (USW 0617 PUS)	2380

22193 7590 02/06/2004

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EXAMINER	
BRANT, DMITRY	
ART UNIT	**PAPER NUMBER**
2655	7

DATE MAILED: 02/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/818,172	CASE, ELIOT M.	
	Examiner	Art Unit	
	Dmitry Brant	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5-6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4 are rejected under 35 U.S.C. 102(e) as being anticipated by Page et al. (6,175,821). The table below summarizes limitations of this applications and parts of Page et al. that "read on" these limitations.

Claim#	Limitations	Page et al.
1	A method for converting text to concatenated voice by utilizing a digital voice library and a set of playback rules, the digital voice library including a plurality of speech items including words and syllables and a corresponding plurality of voice recordings wherein each speech item corresponds to at least one available voice recording, the method comprising:	The system contains ROM (**3, FIG. 1**) that stores recordings of phrase used for messages outputs. In addition, speech converter (**4, FIG. 1**) has a diphone dictionary for converting text to speech.
	training the digital voice library to associate each syllable speech item with a literal text syllable of the	Inherently, for speech synthesis, this dictionary has to be trained (or initially

	particular syllable speech item.	populated) in order to create a mapping between text syllables and dyphones.
2	The method of claim 1 further comprising: receiving a sequence of words including known words that correspond to word speech items in the digital voice library and including unknown words converting each known word into a word speech item in accordance with the digital voice library and for each unknown word, parsing the unknown word to determine a sequence of literal text syllables and converting the text syllable sequence to a sequence of syllable speech items in accordance with the digital voice library.	The system receives a text message (**Col. 4, lines 60-63**), then synthesizes the message using diphone dictionary of speech synthesizer (**Col. 4, lines 63-66**). In addition, invariable (known) portions of the text message are converted directly to preset recordings by message generator (**Col. 5, lines 42-45**)
3	The method of claim 2 further comprising: converting the sequence of word speech items and syllable speech items into a sequence of voice recordings in accordance with the set of playback rules.	The variable and invariable portions are pre-processed in order to produce natural-sounding message (**Col. 5, lines 36-45**)
4	The method of claim 3 further comprising: generating voice data based on the sequence of voice recordings by concatenating adjacent recordings in the sequence of voice recordings.	The variable and invariable portions of the message are concatenated together into a unified recording by message generator (**Col. 5, 45-49**)

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being obvious over Page et al. in view of Karalli et al. (5,668,926).

As per claim 5, Page et al. discloses a speech converter that has a diphone dictionary for converting text to speech (4, FIG. 1).

Page et al. do not disclose training the dictionary by "utilizing a neural network having an input and an output to train the digital voice library with the neural network receiving the literal text syllable of the particular syllable speech item as input and with the neural network outputting the associated syllable speech item."

Karalli et al. teach the use of neural networks to train the text-to-speech system (Col. 2, lines 21-33).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Page et al. as taught in Karalli et al., in order to populate the diphone dictionary in the efficient manner and also provide an effective method of resolving ambiguous inputs to the dictionary.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being obvious over Page et al.

Page et al. do not disclose training the digital library by "manually associating each syllable speech item with the literal text syllable of the particular syllable speech item."

The examiner takes official notice that the method of manually populating look-up dictionaries is well-known to the practitioners in computer arts.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Page et al. by manually associating each literal text syllable with the

corresponding syllable speech item since this would be the most straightforward and "brute force" method of training the dictionary.

6. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being obvious over Page et al. in view of Lin et al. (6,076,060)

As per claim 7, Page et al. discloses a speech converter that has a diphone dictionary for converting text to speech (4, FIG. 1).

Page et al. do not disclose "parsing the unknown word to determine a sequence of literal text syllables and known words, and converting the sequence to a sequence of syllable speech items and word speech items in accordance with the digital voice library. "

Lin et al. teach parsing the unknown word into a sequence of syllables and word speech items (Col. 6, line 56-60) that are later converted to speech sounds (16, FIG. 2)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Page et al. as taught in Lin et al., in order to eventually create a dyphone representation of each unknown word so it could be synthesized by speech synthesizer that requires an input of dyphones to produce the output sound.

As per claim 8, Page et al. do not disclose parsing that comprises:

- parsing the unknown word in the forward direction to determine any known words
- parsing the unknown word in the reverse direction to determine any known words where any known words overlap, selecting the larger word
- parsing the unknown word in the forward direction to determine any literal text syllables
- parsing the unknown word in the reverse direction to determine any literal text syllables.

Lin et al. teach parsing the words in from left-to-right and from right-to-left in order to determine sub-words and literal text symbols (Col. 3, lines 45-53). Also, the large words are chosen first (Col. 3, lines 55-58).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Page et al. as taught in Lin et al., in order to create an efficient parsing technique that more closely matches the way words are parsed when spoken by humans. This method of parsing is less likely to miss important sub-stings in unknown words.

As per claim 9 and 10, Page et al. discloses the calculation and adjustment of pitch of the generated message using transition signals and appropriate voice recordings (Col. 2, lines 32-48)

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being obvious over Page et al. in view of Carter et al. (6,600,814)

Page does not disclose "for each unknown word, after the unknown word is parsed, storing results of the parsing in the digital voice library so that a next encounter with the same unknown word may be handled more efficiently."

Carter et al. teaches storing processed portions of text in the text-to-speech system to alleviate the load on the system (Col 2, lines 30-39).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Page et al. as taught by Carter et al. to store the parsed results of unknown words so that next attempts with the same words were handled more efficiently. This concept of

"caching" data for future reference is extremely well-known and widely used in the art of computing.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Coorman et al. (6,665,641) teaches concatenating synthesizer.

Sharman (5,949,961) teaches word syllabification method for text-to-speech systems.

Conkie (6,173,263) teaches concatenating text-to-speech system that uses prosody analysis.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dmitry Brant whose telephone number is (703) 305-8954. The examiner can normally be reached on Mon. - Fri. (8:30am - 5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Ivars Smits can be reached on (703) 306-3011. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Tech Center 2600 receptionist whose telephone number is (703) 305- 4700.

DB
1/27/04

DORIS H. TO 2/4/04
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600